

Do Your **Genes** Make You Absorb Too Much **Iron**?

You probably know that iron deficiency may lead to anemia. But did you also know that some people absorb too much iron—due to a condition known as hemochromatosis?

Hemochromatosis is an inherited genetic disorder that results in excessive iron absorption and accumulation. Over time, the build-up of iron in vital organs makes people sick and more susceptible to cancer, diabetes, and liver failure.

An estimated 1 of every 200 to 500 people in the United States has genes that can lead to increased iron accumulation, and about 1 percent of those eventually develop symptoms of hemochromatosis. Geneticists characterize these people as “homozygous” because they carry two copies of the altered or mutated gene—one from each parent.

But what about people who carry only one copy of the altered gene? This is surprisingly common, occurring in an estimated 1 of every 10 people in the United States, especially those of Northern European origin.

Nutritionist Janet R. Hunt and molecular biologist Huawei Zeng, with the ARS Grand Forks Human Nutrition Research Center, Grand Forks, North Dakota, have conducted studies to determine whether individuals with only one copy of this genetic mutation could also be at risk of absorbing too much iron.

Those who carry one normal gene from one parent and one mutated gene from the other parent are “heterozygous” and are often called “carriers.” That’s because even though their one normal gene protects them from getting

hemochromatosis, they can pass the mutation on to their offspring.

Hunt, who heads the center’s Micronutrient Absorption and Metabolism Unit, collaborated with Zeng to determine whether carriers also absorb more iron than usual. “If so, then the common practice of fortifying foods with iron could pose a health risk for them,” says Hunt.

For this genotyping study, Hunt and Zeng tested 359 volunteers

by taking DNA samples either from the inside of their cheeks or from blood. Those identified as carriers had their iron absorption measured from regular and iron-fortified meals. Carriers of the mutation did not absorb iron differently than volunteers without the mutation, whether or not the meal was iron fortified. This was true for both forms of iron commonly found in foods: “heme” iron, from meat, poultry, or fish; and “nonheme” iron, found in plant foods as well as animal foods.

The researchers determined that carriers of this particular DNA mutation don’t need to worry about absorbing too much iron. “The study supports public health policies that allow addition of iron to foods to help those at the other end of the scale,

Nutrition Facts

Serving Size ¾ cup (30g)
Servings Per Container About 14

Amount Per Serving	Dry Cereal	with 1/2 cup skim milk
Calories	120	160
Calories from Fat	5	10
	% Daily Value**	
Total Fat 0.5g*	1%	1%
Saturated Fat 0g	0%	0%
Trans Fat 0g		
Polyunsaturated Fat 0g		
Monounsaturated Fat 0g		
Cholesterol 0mg	0%	1%
Sodium 220mg	9%	12%
Potassium 35mg	1%	7%
Total Carbohydrate 26g	9%	11%
Sugars 9g		
Other Carbohydrate 17g		
IRON	50%	50%

SCOTT BAUER (K8983-1)



who may be at risk of too little iron,” says Hunt.—By **Rosalie Marion Bliss, ARS.**
This research is part of Human Nutrition, an ARS National Program (#107) described on the World Wide Web at www.nps.ars.usda.gov.

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